source server 4 and sales agent server 6. The product source comprises the manufacturer or originator of the product or service being purchased. For instance, in the case of securities, the product source comprises the exchange where the security is traded; for airline tickets, the product source comprises the airline carrier; for consumer products, the source comprises the product manufacturer, etc. The sales agent is the entity that sells retail to consumers the product produced or provided by the product source. The consumer computer 2 communicates with the product source server 4 and sales agent server 6 over the Internet 8 in a manner known in the art. The sales agent server 6 allows on-line purchases over the Internet 8 at the server 6. The consumer computer 2 may comprise any computing device known in the art, such as a personal computer, laptop computer, hand held computer, server, cellular phone, telephony device, network appliance, etc. The servers 4 and 6 are computers that may be especially suited for serving data over the Internet 8, such as one or more server class machines.

The consumer computer 2 would execute in memory (not shown) a browser program 10, such as the Netscape Communicator or Microsoft Explorer browser program. The user would manipulate the browser program 10 graphical user interface (GUI) to download a source web page 12 from the product source server 4 and an agent web page 14 from the sales agent server 6, wherein each page 12 and 14 includes code capable of being rendered by the browser program 10, e.g., HTML, extensible markup language (XML), Dynamic HTML (DHTML), etc. The source web page 12 includes a current price of the product as set or determined by the product source of the product or service the consumer is purchasing through the sales agent server 6. The source web page 12 includes code to activate a source program 16 to write the current price data 22 to a shared memory object 20 in a memory region of the consumer computer 2.

The agent web page 14 includes code to activate the agent program 18 to read the current price data 22 written to the shared memory object 20 and display the price data 22 to show that the sales agent intends to use the price as presented by the product source in computing the cost to the consumer.

In the described implementations, the source 16 and agent 18 programs are activated through the browser program 10. Thus, the source 16 and agent 18 programs may be implemented using browser compatible programming architectures known in the art, such as the Microsoft ActiveX controls, Java Applets, JavaBeans, etc.** In such case, the source 12 and agent 14 pages include code to activate the source 16 and agent 18 programs to perform the operations described herein. For instance, if the source web page 12 comprises a Hypertext Markup Language (HTML) page, then the HTML object element is used to add ActiveX controls to the source web page 12. The HTML object element includes a set of PARAM elements that specify which data the control should use and to control the appearance and behavior of the control. For the source web page 12, the PARAM element may comprise the current price information, such as the price per unit of the product the consumer wants as well as a time stamp for the price, and an address of the shared memory object 20 in the consumer computer 2 memory. Note that in the case of Java implementations, the Java source 16 and agent 18 programs may be downloaded from the product source server 4 and sales agent server 6, respectively, and executed from the browser program 10, which in such embodiments is a Java enabled machine. In the case where the source 16 and agent 18 programs are implemented as ActiveX controls, the ActiveX controls may be stored locally on the consumer computer 2 and activated through code in the web pages 12, 14, such as the HTML object element.

FIG. 2 illustrates an example of how the browser program 10 may output the content of the source web page 12 and agent web page 14 on a computer display monitor 24 (FIG. 1) attached to the consumer computer 2. In the example, the product is an airline ticket from the carrier Acme airlines for a one-way trip from Los Angeles, California to Austin, Texas. The consumer computer 2 would include a video adaptor to control the display monitor 24 in a manner known in the art. The consumer computer 2 operating system (not shown) displays a general desktop window 50 and the browser program 10 displays a browser window 52 displaying the content of the source web page 12 and a browser window 54 for displaying the content of the agent web page 14. A "Get Authenticated Price" push button 56 is displayed in the browser window 54, which

triggers code that submits a request to a Universal Resource Locator (URL) address, e.g., an Hypertext Transfer Protocol (HTTP) GET request, from which to obtain the price from the product source server 4. In response to selection of the push button 56, the source web page 12 is downloaded from the product source server 4 and displayed in the browser window 52. The price for the product selected in the agent web page 14 is displayed, which is shown as "$200". In certain implementations, the content of the source web page 52 comprises a digital certificate provided from a certificate authority, e.g., VeriSign Inc., that authenticates that the price displayed in the browser window 52 is from the product source server 4 in a manner known in the art. Using a digital certificate to communicate the price to the consumer computer 2 assures the customer as to the authenticity of the price.

In FIG. 2, if the user selects the "Accept Price" button 58 in the browser window 52, then the price displayed in the browser window 52 is communicated to the browser window 54 to display the price that the agent will apply to the consumer as shown in FIG. 3, where the "Get Authenticated Price" button 56 is replaced with the price 60 provided in the certificate displayed in browser window 52. The consumer can then purchase the ticket by selecting the "Buy Ticket" push button 62.

In the example of FIGs. 2 and 3, both browser windows 52 and 54 are shown as displayed at the same time. The browser windows 52 and/or 54 may comprise a pop-up browser window and/or a browser window including all the menu items displayed. Still further, selection of one browser window 52 or 54 may cause the selected browser to be displayed over the other browser window, thereby requiring the consumer to toggle between browser windows. In alternative implementations, the content of the source web page 12 and agent web page 14 may be displayed concurrently in different frames or display areas of the same browser window using HTML frames technology.

FIG. 4 illustrates the logic implemented in the agent 18 and source 16 programs. Control begins at block 100 with the browser program 10 opening the agent web page 14 in the browser window 54 and activating the agent program 18 called from the agent web page 14. The agent program 18 displays (at block 102) the "Get Authenticated Price"

button 56 (FIG. 2). Upon receiving (at block 104) user selection of the "Get Authenticated Price" button 56, the agent program 18 submits a request, e.g., an HTTP GET request, to the URL for the certificate of the price for the requested product at the product source server 4. At block 120, the browser program 10 opens a new browser window 52 to display the content of the source web page 12 and activate the source program 16 called in the source web page 12. The source program 16 displays (at block 122) the "Accept Price" button 58. In response to the user selecting (at block 124) the "Accept Price" button 58, the source program 16 writes (at block 126) the price data 22, including the price per unit and price timestamp, to the shared memory object 20.

With reference to FIG. 5, at block 150, the agent program 18 reads the price data 22 from the shared memory object 20. The agent program 18 may be signaled after the price data 22 is written to the shared memory object 20 by the consumer computer 2 operating system or signaled directly by the source program 16 after completing the write operation in a manner known in the art. Alternatively, the agent program 18 may periodically query the shared memory object 20 to determine if there is new price data 22. After reading the price data 22, the agent program 18 determines (at block 152) whether the timestamp provided with the price data 22 is outdated. The time duration of the price data 22 differs by product. For instance, the time stamp for a price of a share of stock during trading hours may expire rather quickly, whereas the price data for an airline ticket or consumer product may remain valid for a longer period of time. If (at block 152) the time stamp is outdated (at block 154), then an error message is displayed on the display monitor 24 notifying the user of the consumer computer 2 that the price displayed in the browser window 52 is no longer valid. In such case, the consumer would have to again select the "Get Authenticated Price" button 56. If the time stamp is not outdated, then the agent program 18 displays (at block 156) the price in the price data 22 in the browser 54 at the location 60 (FIG. 3) where the in the "Get Authenticated Price" button was previously displayed. The agent program 18 further displays (at block 158) the "Buy Ticket" button 62 to allow the consumer to purchase the ticket at the indicated price. Before the purchase completes, the time stamp may be checked again to determine

whether the price from the certificate has expired since the price was displayed at location 60 in the browser window 54. When the consumer selects the "Buy Ticket" button 62, the price communicated from the window 52 would be transferred to the sales agent server 6 to use to complete the transaction and determine the price to charge the consumer.

With the above described implementation, consumers obtain an authenticated price quote from the source of the product or service being purchased that is then used directly to determine the price the sales agent charges the consumer. This implementation facilitates Internet commerce because the consumer can immediately engage in the on-line transaction and be assured that the price they are being quoted is a "fair" price set by the source or manufacturer of the product.

Following are some alternative implementations.

The preferred embodiments may be implemented as a method, apparatus or program using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof. The term "article of manufacture" (or alternatively, "computer program product") as used herein is intended to encompass one or more computer programs and data files accessible from one or more computer-readable devices, firmware, programmable logic, memory devices (e.g., EEPROMs, ROMs, PROMs, RAMs, SRAMs, etc.), hardware, electronic devices, a readable storage diskette, CD-ROM, a file server providing access to the programs via a network transmission line, wireless transmission media, signals propagating through space, radio waves, infrared signals, etc. Of course, those skilled in the art will recognize that many modifications may be made to this configuration without departing from the scope of the present invention.

In the described implementations, the information downloaded from one server comprised price information displayed in a user interface window that is transferred to another program displaying content in another user interface window. In alternative implementations, the servers 4 and 6 may not be involved in commercial transactions and the information communicated from one program to another through the consumer

computer may not comprise price information. For instance, the computer 2 may display user interface windows including content from databases and/or applications in two different servers, where data displayed in one of the windows from one of the servers is communicated to the other server.

In the described implementations, the systems 2, 4, and 6 communicated over the Internet 8. In alternative implementations, the systems 2, 4, and 6 may communicate over networks other than the Internet, such as a local area network (LAN), Intranet, USENET, etc.

In the described implementations, the price information communicated to the consumer computer 2 was authenticated using a trusted certificate authority. Alternatively, the price information may not be certified and may be communicated in an uncertified manner from the product source server 4 to the consumer computer 2.

In the described implementations, the content of the source 12 and agent 14 web pages were displayed using a browser program 10 known in the art. In alternative implementations, the source 16 and agent 18 programs may utilize user interface mechanisms other than a browser window to display the content of the source 12 and agent 14 web pages. In such case, the windows 52 and 54 may be implemented using user interface technology other than a browser program that is capable of downloading and displaying the content of pages from over a network such as the Internet. For instance, the agent program may download the price certificate from the product source server 4 and display the price data in a user interface window that is not a browser generated window.

In the described implementations, the price was transferred from the digital certificate displayed in the window 52 to the window 54 through a shared memory object 20. However, those skilled in the art will recognize that many other techniques may be used to allow one application program to communicate data, such as price data, to another executing application that do not involve shared memory.

In the described implementation, a separate agent program accessed the price data and updated the browser 54 to display the price data. In alternative implementations, the

functions performed by the source 12 and agent 14 programs may be implemented in a single program activated by code from the agent web page 14. Alternatively, the source 12 and agent 14 programs may comprise one or more programs, methods, functions, or routines that perform the operations described herein as source and agent program functions.

In the described implementations, the consumer caused the price data to be communicated to the window 54 using the "Accept Price" button 58 (FIG. 2). In alternative implementations, different graphical mechanisms may be used to allow the user to cause the transfer of the price from the certificate displayed in window 52 to window 54 used by the agent. For instance, the source program 16 may display a graphical icon which the user could drag-and-drop to the window 54 to cause the price data 22 to be communicated to the agent program 18 and window 54. Still further, the price data 22 displayed in the certificate window 52 may automatically be communicated to the agent program 18 without requiring user intervention.

In the described implementations, the price data is communicated to the agent locally through the resources of the consumer computer 2. In alternative implementations, the source program 16 may issue a request over the Internet 8 to the sales agent server 6 providing the price data 22 and, in response, the sales agent server 6 would assemble a new agent web page with the price data 22 from the product source server 4 to transfer to the consumer computer 2 over the Internet 8 to display to the user.

In the described implementations, the content in the source 12 and agent 14 pages conforms to the HTML file format. However, alternative file formats for interchanging documents of networks may be used, such as Dynamic Hypertext Mark-Up Language (DHTML), the Extensible Markup Language (XML), Cascading Style Sheets, any other Standard Generalized Markup Language (SGML), Scalable Vector Graphics (SVG), or any other language known in the art for creating interchangeable, structured documents. Further, any version of HTML may be used, including version 2.0, 3.2, 4.0, etc. In yet further embodiments, the requested file may be in any other file format, i.e., other than an

SGML type format, capable of being displayed or otherwise downloaded and displayed in the browser application.

The foregoing description of the preferred embodiments of the invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be limited not by this detailed description, but rather by the claims appended hereto. The above specification, examples and data provide a complete description of the manufacture and use of the composition of the invention. Since many embodiments of the invention can be made without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.

**NETSCAPE is a registered trademark of the Netscape Communications Corporation; WINDOWS, MICROSOFT, and ACTIVEX are registered trademarks of Microsoft Corporation; JAVA is a trademark of Sun Microsystems, Inc.